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Creators: [Stobs, John](#)

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MINE FIRES AND THE MODE OF EXTINGUISHING THEM.

JOHN STOBBS, WAUKEGAN, ILL.

Now, in the first place, it is well known that coal vein fires must be at once extinguished and not allowed to extend over so much of the country, causing such great destruction, as at the present time.

The fact that a fire has burned for the past twenty years in Mercer county, Pennsylvania, destroying millions of tons of coal and hundreds of acres of land, and that it has been decided that it must be allowed to continue to burn until the entire vein is exhausted, shows that no successful plan has yet been adopted for the extinguishing of mine fires. The plan I present will, I think, work successfully. The experience you have had with fires in this State makes this an opportune time for testing my plan, which, I trust, will become standard for extinguishing fires in first coal veins.

Had I been in charge of Mr. Smith's mine at Straitsville at the time it caught fire, I would have put down a small shaft, or put in a slope, whichever would have been the quickest, just ahead of the fire. I would then have taken out the entire coal and let down the whole covering, so that there would be no more coal to burn when the fire reached the covering.

Instead of writing a lengthy paper, I have taken the little time at my command and have drawn this plan, showing the proper way in which all first coal veins ought to be worked, which I will now explain to you. This plan will bring all the wealth there is in the vein to the owners and can be worked with greater conform and safety to the miners.

Thereupon Mr. Stobs explained in detail his plan for extinguishing mine fires, and the following discussion occurred:

MR. BEATTIE: I would like to ask Mr. Stobs if the drawing of those pillars would interfere with the interior of the mine, how he would get the coal to the boundary? Or, does it apply to mines 100 or 160 feet below the surface?



JOHN STOBS.

MR. STOBS: Yes; it will apply to any depth. If the fire is in the center, you would split those pillars near to where the fire is.

MR. BEATTIE: How would you provide for preventing the air from getting to the fire, to prevent it from spreading to the exterior of the mine?

MR. STOBS: It is all taken out there.

MR. BEATTIE: But there is an air current there?

MR. STOBS: No, sir.

MR. BEATTIE: How will you exclude the air from the fire?

MR. STOBS: By this piece being taken out. It leaves the land in better shape than ever.

MR. BEATTIE: In case you succeed in drawing your pillars in the confines of the solid coal to allow the overlying strata to close in, would not the air reach through the crevices from the surface?

MR. STOBS: No, sir.

MR. BEATTIE: If a fire gets oxygen, will it not keep it alive?

MR. STOBS: No; it will not keep it alive if there is nothing to burn.

MR. MORRIS: Suppose the coal is inside of where the fire is, how will you get the coal out?

MR. STOBS: Go to the other side.

MR. MORRIS: Suppose you cannot go to the other side?

MR. STOBS: What would stop you?

MR. MORRIS: The fire would not go anywhere unless it had fuel to burn?

MR. STOBS: No, sir; that is my idea.

MR. BROPHY: I would like to ask if any one here can from observation or experience say whether it is the truth that if the coal is all drawn out there the fire would not continue? It is a

question in my mind whether the fire would stop simply because the coal is withdrawn.

MR. MILLER: I have seen slate made redhot from fire, but there was coal to create the fire. I believe the gentleman stated that if we clean everything out the fire will die.

PRESIDENT RAY: I will ask if you have succeeded in putting out any fires by that method?

MR. STOBBS: No, sir; I have not had occasion to. But I have worked on that kind of a plan.

PRESIDENT RAY: It is a theory you have, which you think would be successful?

MR. LOVE: I do not want to ask any questions, for I think the plan the gentleman has brought forward is a good one and I think if the coal is taken out, the pillars removed, there will be no room for fire; in fact, there will be nothing to burn. I do not think slate will burn without something to burn it. But the greatest difficulty, as I understand it, will be to entirely close the space and shut out all possible oxygen. But we in Ohio have not yet adopted a system by which we can remove all the coal. If we could adopt that plan, I think there is no doubt we could extinguish mine fires in that way.

MR. BEATTIE: Mr. Chairman, I presume we will have to concur in Mr. Love's remarks, for who ever saw a case where all the refuse matter was taken out of a coal mine? That is one of the features about these fires, that the refuse matter will burn and convey the fire through the mines as long as it gets oxygen. What we want is something practical that will extinguish fires in coal mines at the least expense, and I do not think this plan will do it. I had had some experience, but I never attempted such an expensive system as that. I know of no mines, even shallow ones, in which that system would work successfully, for the air would penetrate through the crevices from the surface. I know of one which has been burning over twenty years where the attempt to close up the crevices in the surface has not been successful. So I am asking questions to find out if there are any

other means of extinguishing fires than by excluding the oxygen from the fire. It has been demonstrated that as long as a fire gets oxygen it will burn.

PRESIDENT RAY: I think the scheme is very logical, inasmuch as the fire is put out by removing the inflammable material, and it would be successful if that could be done practically.

SECRETARY HASELTINE: I do not know whether it is generally known that there is a movement on foot to stop one of the mine fires which has been burning for many years in the Hocking valley. During the summer in one of the mines near Longstreth, the fire, which had been walled up, was allowed to get through into the rooms and pillars on the other side. The plan now is to go into another pair of entries further along and take out a strip of coal, I believe, fifty feet in width, to take out all of the material and top coal, as well, and then use dynamite on the sandstone and shoot it down. I said I thought it would be successful, provided they can get it down so the roof will set flat on the floor. But in falling, the sandstone might make an archway between the fire on one side and the coal on the other. If it could be taken out to a great width so as to prevent the roof lodging in that way, it would do as Mr. Stobs has explained here, and I believe it would stop a fire, under circumstances where the coal can be removed in that way. The mine fires in the last seven or eight years have not been of such a character that this remedy could be applied.

MR. BEATTIE: I am somewhat familiar with the mine of which the Chief speaks. The cutting through the coal in advance of the fire was done, but the fire went over to the pillars.

MR. LOVE: What did you leave the pillars there for?

MR. BEATTIE: If you will answer me why you leave 33 1-3 per cent. of the coal in the mines, I will answer your question. The rock gets so hot from the fire, it gets to an inflammable heat and when the air comes in contact with it, it ignites the coal in close proximity to it. That has been my experience in all mine fires and the only remedy which has been successful is where the

coal is deep enough under the surface so it is not cracked through, to bank it down and exclude the air. It must be left long enough to cool the rocks below the flashing point, when the air can be turned in.

MR. JONES (of Illinois): It may be out of order, but I will describe how a fire was put out in a mine in northern Illinois, in the section of which I have charge. The fire had not yet got to the coal. We got down as near as we possible could and put a stopping on the main entry. We stopped both downcast and upcast with packs of sand until it was perfectly tight. Through the downcast there was a three inch pipe run and the boilers connected therewith. Steam was turned into the mine with all the pressure that could be put onto the boilers and left that way for a few days. It worked successfully and saved the mine. It also saved the haulage work.

MR. MILLER: I like this gentleman's plan of using steam very much, and I like the other gentleman's idea very well, provided the vein is a clean vein. But we have a great deal of rubbish in the Hocking valley vein; half is left and it burns easily. I think if fifty feet could be cleaned out on both sides we could extinguish a fire in that manner.

MR. BROPHY: Since one of the ingredients of sandstone is silica and this is oxidizable, I do not believe that sandstone will stop a fire. There is a mine which has been burning since '79 and there is not a pound of coal in it. There is nothing there but quartz, perhaps some minerals. The quartz is not in the form of sandstone, but in a different form. But it causes considerable trouble yet. In a mine on the northern Pacific coast last winter, though there was no coal in it, the tunnel got on fire. They bratticed the tunnel up and put steam in. After a full month they opened it up and found the tunnel still on fire. This leads to the conclusion that this mode will not stop a fire, and I do not believe there is any certainty in regard to stopping a fire of that kind.

PROFESSOR LORD: In regard to any sort of underground fire, two or three things must be considered. Take most of the

rock coal, slate, or anything else, and let it get thoroughly heated, —and this heat can be developed either from burning coal, oxidizing of sulphates by water and a large number of reactions which might take place and develop heat in a large amount, probably slowly. Now, the great trouble with underground fires is, we have two problems to meet. The first is the prevention of the further development of heat, and the other is the removal of the heat already formed. Take most of the coal strata three or four feet in thickness heated for a large area, two or three acres, up to the ignition point of coal, close it up and you may stop further combustion and in that case put out the fire. But you do not get rid of the heat and the minute you let the air in, it will burn again. So in an instance where it is closed in, the fire is not burning while it is closed, but the temperature remains at the ignition point and the minute you let air in it burns again.

On motion of Mr. Miller, a vote of thanks was tendered Mr. Stobs for his paper.

And thereupon, on motion, meeting adjourned until Thursday morning, January 21, 9:30 a. m.

MORNING SESSION — JANUARY 21, 9:30.

Upon the opening of the morning session by President Ray, the announcement was made that all who desired to participate in the excursion on Friday must procure tickets for themselves and friends from Secretary Haseltine to-day.

The following paper was presented by Mr. C. V. Martin, of Zanesville: